**AMENDMENTS TO THE CLAIMS:**

The listing of claims will replace all prior versions, and listings of claims in the application:

**LISTING OF THE CLAIMS**

1. (Currently amended) A method for generating an echo profile in a time-of-flight ranging system, said method comprising the steps of:

transmitting one or more bursts of energy towards a surface;

receiving reflected pulses from said surface, and converting said reflected pulses into an echo profile, said echo profile including an echo signal;

determining a receive time for said echo signal, said receive time being based on a time reference to a measurement point on said echo signal, said echo signal having an amplitude and said measurement point being taken relative to the amplitude;

applying a correction to said receive time, wherein said correction is applied in response to a change in the amplitude of said echo signal and said applying comprises determining a signal-to-noise ratio for the change in amplitude and using a slope for an edge of said echo signal to determine a correction factor for said receive time. .

2. (canceled)

3. (Currently amended) The method for generating an echo profile as claimed in claim [[2]] 1, wherein the edge of said echo signal comprises a leading edge, and said correction factor $C_f$ is determined as follows:

$C_f = ((SNRC - SNR)/(S_a))$ [[+ Of]]

Where: $C_f$ = correction factor

$S_a$ = slope of leading edge of echo pulse

SNR = signal to noise ratio

SNRC = signal to noise ratio at calibration.

4. (Original) The method for generating an echo profile as claimed in claim 3, wherein said measurement point is taken at an approximately mid-way point for an echo signal having a. given amplitude, and wherein said correction factor determination includes a calibrated offset $O_f$ as follows:

$$C_f = ((SNRC - SNR)/ (S_a)) + Of.$$

5. (Original) The method for generating an echo profile as claimed in claim 4, wherein said signal-to-noise ratio comprises the difference between the amplitude of said echo signal and a noise floor.

6. (Original) The method for generating an echo profile as claimed in claim 5, wherein said noise floor is variable, and the amplitude of said echo signal, is subject to attenuation.

7. (Currently amended) A level measurement apparatus for measuring the level of a material contained in a vessel, said level measurement apparatus comprising:

a transducer module, said transducer module including a transducer for transmitting energy pulses in response to application of transmit signals, and said transducer being responsive to receiving energy pulses and converting said received energy pulses into echo signals;

a transceiver module for transmitting said transmit signals and receiving said echo signals, and said transceiver module including processing means for processing said echo signals into an echo profile, said echo profile comprising one or more echo pulses;

said processing means including means for determining a receive time for each of said echo pulses;

said processing means including means for adjusting the receive time for said echo pulses in response to a change in the amplitude of said echo pulses or a change in noise floor <u>and said means for adjusting the receive time comprises means for generating a correction factor, said correction factor being based on a signal-to-noise determination and a slope value for a leading edge of said echo pulse</u>;

said processing means including means for calculating a level measurement for the material contained in the vessel, said level measurement being based on the time between the transmission of said energy pulses and the receive time of said echo pulses.

8. (canceled)

9. (Currently amended) The level measurement system as claimed in claim [[8]] 7, wherein said correction factor Cf is determined as follows:

$C_f = ((SNRC\text{-}SNR)/(S_a))$ [[+ $O_f$]]

Where: Cf = correction factor

$S_a$ = average slope of leading edge of echo pulse

SNR = signal to noise ratio

SNRC = signal to noise ratio at calibration.

10. (Original) A method for generating an echo profile in a time-of-flight ranging system, said method comprising the steps of:

transmitting an ultrasonic energy burst towards a surface;

receiving reflected pulses from said surface, and converting said reflected pulses into an echo profile, said echo profile including a plurality of echo pulses;

determining a receive time for each of said echo pulses, said receive time being based on a time reference to a measurement point on said echo pulses, each of said echo pulses having an amplitude and said measurement point being taken relative to the amplitude;

applying a time, correction to said receive time, wherein said correction is applied in response to a change in characteristics of said echo pulse;

said step of applying a time correction includes determining a correction factor $C_f$ as follows:

$C_f = ((SNRC\text{-}SNR)/(S_a)) + 0_f$

where: $C_f$ = correction factor

$S_a$ - slope of an edge on said echo pulse

SNR = signal to noise ratio

SNRC = signal to noise ratio at calibration

$O_f$ = calibrated offset; and adding said

correction factor $C_f$ to said receive time.

11. (Original) The method as claimed in claim 10, wherein said change in said echo pulse comprises attenuation of said echo pulse.

12. (Original) The method as claimed in claim 11, wherein said change in said echo pulse comprises a change in noise floor, and said change in noise floor changing said signal-to-noise ratio.

13. (Original) The method as claimed in claim 12, wherein said slope comprises the average slope of the leading edge of said echo pulse.

14. (Currently amended) A level measurement device for measuring a distance to a material having a surface, said level measurement device comprising:

a transducer for emitting energy pulses and detecting energy pulses reflected by the surface of the material;

a controller having a receiver and a transmitter;

said transducer having an input port operatively coupled to said transmitter and being responsive to said transmitter for emitting said energy pulses, and said transducer including an output port operatively coupled to said receiver for outputting reflected energy pulses coupled by the transducer;

said receiver including a converter for converting said reflected energy pulses into echo signals;

said controller including a program component for generating an echo profile based on said echo signals;

said processing means including a program component for calculating a receive time for each of said echo signals;

said processing means including a program component for adjusting the receive time for said echo signals in response to a change in the amplitude of said echo pulses or a change in noise floor, said program component for adjusting the receive time generating a correction factor and said correction factor being based on a signal-to-noise determination and a slope value for a leading edge of said echo pulse;

said processing means including a program component for calculating a level measurement for the material contained in the vessel, said level measurement being based on the time between the transmission of said energy pulses and the receive time of said echo signals.

15. (Original) The level measurement device as claimed in claim 14, wherein said program component for adjusting the receive time calculates a correction factor $C_f$ as follows:

$$C_f = ((SNRC - SNR)/ (S_a)) + O_f$$

where: Cf = correction factor

$S_a$ = slope of an edge on said echo pulse

SNR = signal to noise ratio

SNRC = signal to noise ratio at calibration

$O_f$ = calibrated offset; and said program component adds said correction factor $C_f$ to said receive time.